

Program Notice

FGIS-PN-05-03

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NIRT WHEAT PROTEIN CALIBRATION

1. PURPOSE

This program notice announces the Grain Inspection, Packers and Stockyards Administration (GIPSA) implementation of the Artificial Neural Network (ANN) wheat calibration for official wheat protein testing (on all classes of wheat). This action is effective May 1, 2005. GIPSA will discontinue its support of previous wheat calibrations.

2. BACKGROUND

For several years GIPSA has explored the possibility of switching from current wheat protein calibrations, developed using partial least squares (PLS) techniques, to a "global" ANN calibration, developed in cooperation with a group of international collaborators. Citing the potential for greater accuracy and consistency for official domestic and international grain quality measurements, GIPSA conducted, in concurrence with a Grain Inspection Advisory Committee resolution, a pilot test to evaluate the accuracy of ANN calibrations for wheat protein. The pilot study included current market samples from major production/handling locations to compare wheat protein results obtained using the current PLS calibrations and the ANN calibrations, and to compare PLS and ANN results to the standard reference method of testing, Combustion Nitrogen Analyzer (CNA).

GIPSA thoroughly analyzed the statistical data generated by the pilot study, performed an economic impact analysis based on a potential change to ANN calibrations, and determined that a switch to an ANN calibration would be beneficial to GIPSA and the wheat industry. GIPSA's economic impact analysis can be found at <http://www.usda.gov/gipsa/tech-servsup/metheqp/ann/ann-wheat.htm>

3. CHANGES TO OFFICIAL WHEAT PROTEIN TESTING PROCEDURES

- a. Equipment Requirements. The ANN wheat protein calibration available from Foss can only be installed on Foss Infratec Model 1241 instruments or older Infratec models equipped with IRIS operating software. The ANN calibration cannot be loaded onto most Infratec Model 1225 and 1226 instruments currently in use with PLS calibrations.
- b. ANN Wheat Protein Calibration. GIPSA has worked with Foss to prepare an official calibration diskette that contains all of the application models needed to implement the wheat protein on May 1, 2005. The diskette also contains calibrations for barley protein.

- (1) The calibration package includes an all class wheat protein application model, as well as an individual-class application models which use the wheat prediction model WBPR0028.
 - (2) Official agencies may obtain the official calibration diskette from Foss North America by requesting the Infratec Application Disk “Small Grain F”. This item is maintained in Foss’s inventory as Part Number 1001 4260.
- c. Standard Reference Samples.
 - (1) The standard reference sample (SRS) set will be comprised of six samples selected from existing individual class SRS samples. Specific sample and baseline information will be provided to all testing locations by April 1, 2005. Revised NIRT Daily and Weekly Wheat SRS Worksheets will also be issued at that time.
 - (2) For those testing locations which do not already have a full set of SRS samples, the Inspection Systems Engineering branch (ISE), Technical Services Division (TSD), will provide the samples necessary to complete the ANN SRS set by April 1, 2005.
- d. Handbook Revision. The NIRT Handbook will be revised by April 15, 2005, to include information concerning the calibration, setup, and maintenance of NIRT instruments using ANN calibrations.
- e. Monitoring Samples.
 - (1) Official wheat protein testing locations will continue to submit wheat protein monitoring samples in accordance with Chapter 5 of the NIRT Program Handbook. Identification of class is still required when submitting monitoring samples.
 - (2) The wheat protein monitoring control chart tolerances, as stated in Chapter 5, will remain the same.

4. FILING INSTRUCTIONS

File a copy of this program notice with the NIRT Handbook. The Handbook will be revised at a later date to incorporate these changes.

5. QUESTIONS

Direct any questions concerning the ANN wheat protein calibration implementation procedures to Mark Leppert, Inspection Systems Engineering Branch, TSD, (816) 891-0433; or email at mark.leppert@usda.gov

/s/ David Orr

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